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Modeling, Simulation and Training Procedural Skills: user experience and acceptability of a virtual reality simulator for scrub nurses in neurosurgery

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Introduction & Purpose

Assess acceptability and user experience of a VR simulation to train procedural skills for scrub nurses with dedicated models and validated tools



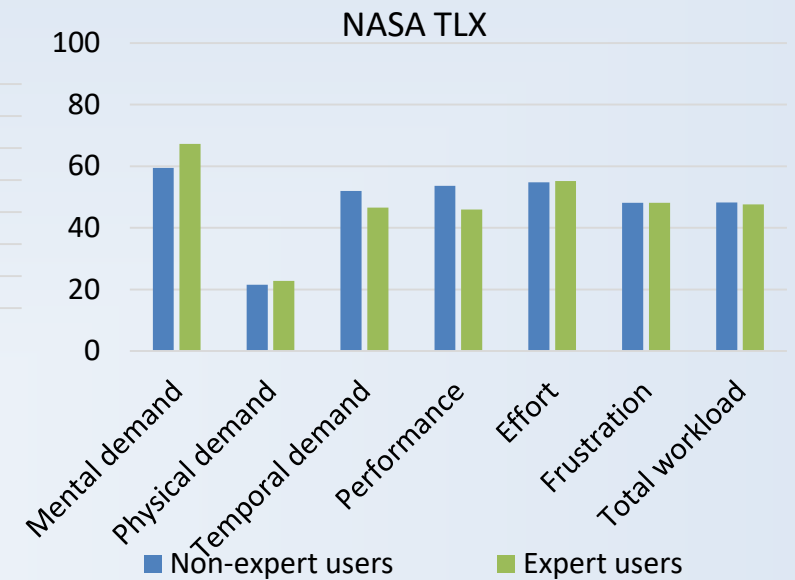
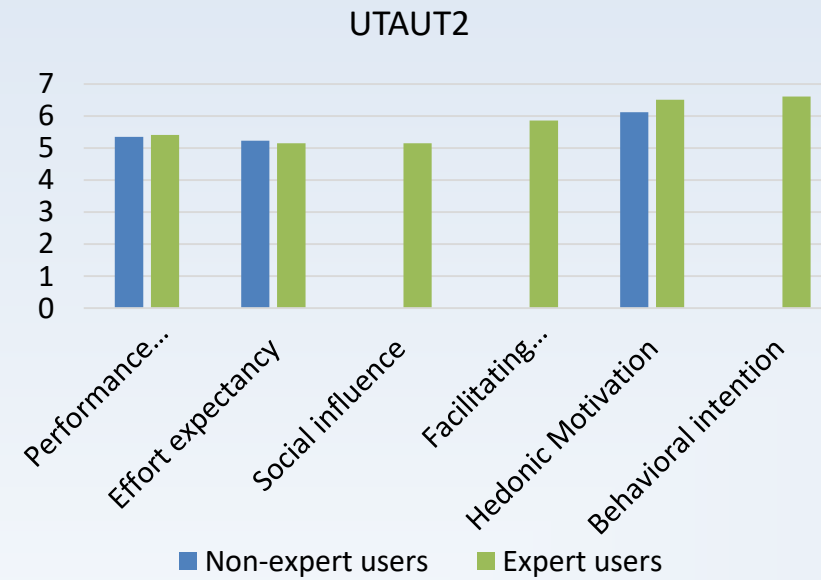
Materials & Methods

- ✓ Scenario based on annotated video observations recorded in the OR
- ✓ 150 surgical instruments and 50 different interactions
- ✓ Acceptability assessed with the Unified Theory of Acceptance and Use of Technology (UTAUT) questionnaire¹
- ✓ User experience assessed with NASA TLX² (workload), SUS questionnaire³ (presence) and SSQ⁴ (simulator sickness)
- ✓ Qualitative data from post test interviews and logs



Results

	Non-expert users	Expert users
Participants	PhD students /students/ engineers 8 males 8 females mean age : 26.6 (SD = 7.54)	Scrub nurses in neurosurgery 13 females mean age : 42 (SD=7.7)
Presence	4.47/7 (SD = 1.14)	5.10/7 (SD = 0.96)
Simulator sickness	3.94/33 (SD =3.39)	3.15/33 (SD =2.97)
Time	13.44 min (SD = 3.65)	14.71 min (SD =19.25)



Discussion and Conclusion

- Acceptability the VR simulator was demonstrated for all participants
- No statistical significant differences regarding age, gender and expertise
- Most participants stressed its pedagogical interest, fun and realism
- VR simulator was validated for initial and vocational training

Limits

- small sample size
- experts from only one specialty and department

Following steps

- Measure transfer of skills to the OR
- Development of Non-Technical Skills (NTS) scenarios
- Intercultural studies

1. Venkatesh V, Thong JY, Xu X. Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. MIS quarterly. 2012;36(1):157-178. 2. Hart SG, Staveland LE. Development of NASA-TLX (Task Load Index): Results of Empirical and Theoretical Research. In: Advances in Psychology [Internet]. Elsevier; 1988. 3. Slater M, Usoh M, Steed A. Depth of presence in virtual environments. Presence: Teleoperators & Virtual Environments. 1994;3(2):130-44. 4. Kennedy RS, Lane NE, Berbaum KS, Lilienthal MG. Simulator sickness questionnaire: An enhanced method for quantifying simulator sickness. The international journal of aviation psychology. 1993;3(3):203-20.